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ABSTRACT

Between September and December 1986, the Marine Institute in Newfoundland, Canada, used a "projects approach" to train aquaculture workers for 10 new salmon farms to be opened in spring 1987 by a producers' cooperative. The projects approach combined instruction in the aquaculture skills needed to operate a salmon farm and the entrepreneurial skills necessary to set up and manage a farm successfully. Every student in the program was required to prepare an acceptable business plan for his/her own farm, including a statement of purpose, a description of the business, a marketing strategy, a management plan, and complete financial projections for the first three years of operation. The inclusion of the business plan as a program requirement changed the curriculum from a traditional biology-centered model to a business-centered model. This business orientation was also stressed in a required business course, which addressed such topics as "Assessing Your Potential as an Entrepreneur," "Arranging Financing," "Maintaining Complete and Accurate Records." Other course requirements included "Aquaculture Technology," "Fish Culture," "Fish Health," and "Fish Handling." The same approach was used by the Marine Institute for its five-week "Fundamentals of Longline Mussel Culture Program" in 1987 and 1988. Course descriptions are attached. (AJL)

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MARINE INSTITUTE

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A PROJECT APPROACH TO TEACHING AQUACULTURE AND ENTREPRENEURIAL SKILLS IN THE CAGE CULTURE OF SALMONIDS PROGRAM AT THE MARINE INSTITUTE

JANUARY 28, 1988

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A PROJECT APPROACH TO TEACHING AQUACULTURE AND ENTREPRENEURIAL SKILLS IN THE CAGE CULTURE OF SALMONIDS PROGRAM AT THE MARINE INSTITUTE

ABSTRACT

For the first time in Canada, a "projects approach" was used as the method of teaching an aquaculture program. The "projects approach" combined the teaching of the technical aquaculture skills necessary to operate a salmon farm and the entrepreneurial skills necessary to set up and manage a farm successfully

Every student in the program prepared a business plan for his own salmon farm. The business plan included a statement of purpose, a description of the business, a marketing strategy, a management plan, and complete financial projections for the first three years of operation. The Introduction to Business course also included the following topics: Assessing Your Potential as an Entrepreneur, Arranging Financing, Maintaining Complete and Accurate Records. Other courses in the program included Aquaculture Technology, Fish Culture, Fish Health, and Fish Handling.

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Introduction

The driving factor in developing this innovative approach was the emerging status of the industry which meant that, while all course participants would go to work in the industry, some would become operators and others farm workers. The sensitivity of an aquaculture business's internal operational, financial and other environments was deemed to be essential even for farm workers. This orientation was a creative response to a lack of access to demonstrative and experimental facilities through which students could be encouraged to learn by their own "mistakes".

The course was very successful due to the commitment of the participants, whatever their educational level (Grade 6 to 1 Year University) and age (21 years to 51 years) and of the faculty (the team included a mathematician who taught feed ratios, survival calculations and business ratios rather than mathematics). Government and industry created opportunities to provide practical insights to the participants even though no agency had facilities to dedicate to this program.

The program was innovative and was an example of improvisation by an institute responding to the appearance of a new industry sector. After advisory committee input in the summer of 1986, a single aquaculture instructor designed and coordinated development of the course. The small core technical staff was used to orient a full range of other faculty capabilities to supporting the "project approach".

History

The Rural Development Association in Baie D'Espoir, Newfoundland, had a dream in the mid 1970's. The dream was to develop a $15 million salmon farming industry in the Baie D'Espoir area.

Having no expertise in aquaculture, the Rural Development Association consulted the Marine Sciences Research Laboratory, St. John's, Newfoundland. Feasibility studies conducted by the MSRL indicated that salmon farming was viable in the Baie D'Espoir area, and in 1983 work began on a $2 million hatchery with a potential annual output of 800,000 smolt.

The hatchery had 60,000 - 70,000 S-1 smolt ready to be turned over to private salmon farmers in the spring of 1987. A producers' cooperative was formed by local entrepreneurs to coordinate production and marketing for 10 small salmon farms which would receive 6,000 smolt each.

The Marine Institute approached the Baie D'Espoir Salmon Growers Co-op in 1986 with a proposal to design and deliver a program to train 12 aquaculture workers for these new salmon farms. The program was to be sponsored by CEIC and specifically designed to meet the needs of the salmon farming industry in the Baie D'Espoir area.

The proposal was accepted, and the Marine Institute delivered the "Cage Culture of Salmonids" program from September to December, 1986.

Description of Innovation

For the first time in Canada, a "projects approach" was used as the method of teaching an aquaculture program. The "projects approach" combined the teaching of the technical aquaculture skills necessary to operate a salmon farm and

the entrepreneural skills necessary to set up and manage a farm successfully.

Every student in the program prepared a business plan for his own salmon farm. The business plan included a statement of purpose, a description of the business, a marketing strategy, a management plan, and complete financial projections for the first three years of operation. The Introduction to Business course also included the following topics: Assessing Your Potential as an Entrepreneur, Arranging Financing, Maintaining Complete and Accurate Records. Other courses in the program included Aquaculture Technology, Fish Culture, Fish Health, and Fish Handling.

Preparation of an acceptable business plan was a requirement for successful completion of the program. In effect, this changed the curriculum from a biology-centered model to a business-centered model. Several excellent business plans were produced by students in the program (See attachment). Their achievements are all the more remarkable when you consider that educational backgrounds ranged from elementary school in the 1950's to university level training, and ages ranged from 21 to 51.

The program was well received by the participants as indicated on student surveys completed at the end of the program.

Update on Use of Innovation

The "project approach" was used again at the Marine Institute in the five-week "Fundamentals of Longline Mussel Culture Program" which was conducted for the first time from Janaury 12 to February 13, 1987, and again from January 4, 1988 to February 12, 1988. Once again, several excellent business plans were completed by participants in the program.

Summary of the Innovative Features

1. Salmon farming is a new industry for Newfoundland and this was the first program designed to train workers for the aquaculture industry in our province.

2. Participants had a wide variety of educational backgrounds ranging from elementray school in the 1950's to university level training, and ages ranging from 21 to 51.

3. Preparation of an acceptable business plan was a major requirement of the Program. In effect, this changed of the curriculum from a traditional biology-centered model to a business-centered model.

4. The program was a co-operative venture involving government, industry, the university, and the Marine Institute.

5. Improvisation - There was no campus fish-holding facility, so participants made use of outside faciliities such as the government hatchery at Baie D'Espoir and field trips to local aquaculture enterprises.

Contacts

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DOCUMENTATION

PROGRAM DESCRIPTION

CAGE CULTURE OF SALMONIDS

TITLE: CAGE CULTURE OF SALMONIDS

OBJECTIVE: To provide prospective farmers with an introductory course in culture and husbandry techniques necessary to grow salmonids on a marine cage farm.

COURSE PRESENTATION: The twelve (12) week course will include lectures and audiovisual presentations by faculty of the Marine Institute, invited speakers from industry, Newfoundland and Labrador Department of Fisheries, Fisheries and Oceans, Canadian Coast Guard, NORDCO, and others. The course will consist of eight (8) weeks of theoretical and field study at the Marine Institute followed by four (4) weeks of practical training in a fish culture environment.

COURSE CONTENT: The course will include presentations and discussion of Salmonid biology, production data of wild cultivated salmonids, site selection criteria, lease application procedures, cage construction, culture methods, husbandry techniques, data collection, record keeping, nutrition, food formulation, feeding, disease recognition, a processing, marketing, business management and scuba diving.

COURSE COST: To be determined in consultation with the Marine Institute.

INTERESTED CONTACT:

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LIST OF TOPICS

CAGE CULTURE OF SALMONIDS

CAGE CULTURE OF SALMONIDS

1. INTRODUCTION

   (a) Cultivated Salmonid Species

   (b) World Production

      (i) Wild and Cultivated

      (ii) Producing Countries

      (iii) Supply and Demand

11. SALMON BIOLOGY

   (a) Life History

   (b) Fresh Water Life

   (c) Smolting, Migration and Osmosis

   (d) Maturation, Size and Fecundity

   (e) Reproduction

   (f) External Anatomy of Salmonids

   (g) Internal Anatomy of Salmonids

111. SITE SELECTION CRITERIA

   (a) Shelter

   (b) Temperature

   (c) Salinity

   (d) Depth

   (e) Water quality (Ph, suspended solids, turbidity, .02 etc.)

(f) User Conflicts

IV. CAGE DESIGN, CONSTRUCTION AND MAINTENANCE

(a) Size

(b) Flotation

(c) Materials

(d) Anchorage

(e) Predator Nets

(f) Net Cleaning and Changing

(g) Net Repair

V. HUSBANDRY

(a) Transportation of live fish

(b) Stocking Densities

(c) Feeding and Nutrition

(i) Composition of Foods

(ii) Types of Foods

(d) Formulation of Wet and Dry Foods

(e) Food Storage of Wet and Dry Foods

(f) Feeding Rates

(g) Size Grading

VI. FISH HEALTH

(a) Factors Affecting Fish Health

(b) Nutritional Diseases

(c) Parasitic Diseases

(d) Bacterial Diseases

(e) Viral Diseases

(f) Disease Recognition

(g) Disease Prevention

(h) Disease Treatments

(i) Disease Transmission

(j) Medications

(a) Chemicals

(b) Drugs

(c) Vaccines

(k) Fish Health Protection Regulations

VIII. RECORD KEEPING

(a) Importance of

(b) Daily Records

(i) Temperature, Sality, Turbidity, etc.

(ii) Food

(c) Weekly Records

(i) Weight Samples

(ii) Food

(d) Monthly Records

(i) Food

(ii) Growth

(iii) Inventory

VIII. BUSINESS MANAGEMENT

(a) Bookkeeping

(b) Taxation Records

(c) Business Plans

(d) Cash Flow Projections

(e) Financial Statements

1X. WATER SAFETY, SWIMMING, SCUBA

One week will be contracted out to teach the basic concepts of Scuba Diving. Those unable to swim will be given an opportunity to learn.

X. PERMITS, LICENSES, REGULATIONS

(a) Navigable Waters Protection Act

(b) Water Leases

(c) Product Inspection

(d) Insurance

(e) Technical Assistance

X1. ECONOMICS OF SALMONID FARMING

(a) Investment costs

(i) Capital Costs

(ii) Labor costs

(iii) Operating costs

(iv) Interest

(v) Taxes

(b) Revenue

(c) Cash Flow

(d) Financial Programmes

(i) Provincial Agencies

(ii) Federal Agencies

(iii Private Lenders

(iv) Venture Capital

XII. HARVESTING AND PROCESSING

(a) Quality Products

(b) Killing Methods

(c) Cleaning Methods

(d) Transporting a Quality Product

XIII. BUSINESS COMMUNICATIONS

(a) Study Skills

(b) Business Correspondence

(c) Oral Communication

(d) Effective Listening

(e) Vocabulary Development

(f) Career Planning

COURSE DESCRIPTION

INTRODUCTION TO BUSINESS

COURSE TITLE: INTRODUCTION TO BUSINESS

DURATION: 35 PERIODS

COURSE AIMS:

1 To develop an awareness of what it takes to become an entrepreneur.

2. To assist students in developing a business plan.

3. To enable students to appreciate the steps involved in establishing a business

MAJOR TOPICS:

1. Assessing your Potential as an Entrepreneur.

2. Developing your Business Plan.

3. Arranging Finances.

4. Keeping Complete and Accurate Records.

5. Marketing.

COURSE OUTLINE

INTRODUCTION TO BUSINESS

INTRODUCTION TO BUSINESS

1. ASSESSING YOUR POTENTIAL AS AN ENTREPRENEUR

    1.1 The Nature of Small Business in Canada

    1.2 What Good Managers Do

    1.3 Characteristics of Successful Entrepreneurs

2. DEVELOPING YOUR BUSINESS PLAN

    2.1 Why a Good Business Plan Is Necessary

    2.2 The Elements of a Business Plan

        2.21 Description of the Business

        2.22 Marketing Plan

        2.23 Organizational Plan

        2.24 Financial Plan

    2.3 Preparing Your Business Plan

3. ARRANGING FINANCING

    3.1 The Sources of Financing

    3.2 Anticipating the Lender's Requirements

    3.3 Preparing a Loan Submission

    3.4 The Loan Interview

4. MAINTAINING COMPLETE AND ACCURATE RECORDS

    4.1 Financial Records

    4.2 Controlling Accounts Receivable

    4.3 Purchasing and Inventory Control

4.4 Personnel Records

5. MARKETING

5.1 What is Marketing?

5.2 The Elements in the Marketing System

5.3 The Marketing Plan

5.4 Feedback and Evaluation

LEARNING OBJECTIVES

INTRODUCTION TO BUSINESS

1. ASSESSING YOUR POTENTIAL AS AN ENTREPRENEUR

1.1 The Nature of Small Business in Canada

1.11 List five characteristics of a small business

1.12 Identify the major cause of small business failures in Canada

1.13 Analyze the risks and rewards of owning your own business.

1.2 What Good Managers Do

1.21 Define the activities of a good manager

1.3 Characteristics of Successful Entrepreneurs

1.31 Describe the characteristics of successful entrepreneurs.

1.32 Assess your own potential as an entrepreneur.

2. DEVELOPING YOUR BUSINESS PLAN

2.1 Why a Good Business Plan Is Necessary

2.11 State two reasons for preparing a business plan.

2.12 Identify the need for adequate planning and consultation before starting a business.

2.2 The Elements of a Business Plan

2.21 Describe the following sections of a business plan:

A. Description of the Business

B. Marketing Plan

C. Organizational Plan

D. Financial Plan

2.3 Preparing a Business Plan

2.31 Write a business plan for a potential business, including the following financial documents:

A. Financial Plan

B. Starting Balance Sheet

C. Annual Profit/Loss Forecasts for First Three Years

D. Cash-flow Projection for First 12 Months of Operation

3. ARRANGING FINANCING

3.1 The Sources of Financing

3.11 List the private and government sources of financing for a new business.

3.12 Describe the various types of loans and grants available from each source.

3.13 Define the following terms:

A. Working Capital

B. Equity

C. Cash Flow

3.2 Anticipating the Lender's Requirements

3.21 Explain what the lender will want to know about you and your business.

3.3 Preparing a Loan Submission

3.31 Identify the paper work normally requested by the lender, such as:

A. Resume of the principals

B. Resume of the business

C. Personal financial statements

D. Financial statements and forecasts

E. Cash-flow projection

F. List of securable assets

G. Copies of leases, mortgages, etc.

H. A business plan

3.4 The Loan Interview

3.41 Explain how to approach a lender for a business loan.

3.42 Identify some non-verbal factors which may affect the lender's decision.

4. MAINTAINING COMPLETE AND ACCURAGE RECORDS

4.1 Financial Records

4.11 List five reasons for keeping records.

4.12 State guidelines for maintaining business records.

4.13 Explain the advantages of the "one-book" system of bookkeeping.

4.14 Define:

A. Asset

B. Liability

C. Capital

D. Revenue

E. Expense

F. Income Statement

G. Balance Sheet

4.2 Controlling Account Receivable

4.21 State why most businesses sell on credit.

4.22 Define the four "C's" of granting credit.

4.23 Explain the function of each of the following documents in controlling accounts receivable:

A. Accounts Receivable Ledger Card

B. Accounts Receivable Age Analysis

C. Statement of Accounts

D. Statement of Accounts Receivable

E. Trend Analysis ($ percentage)

4.3 Purchasing and Inventory Control

4.31 Explain the function of each of the following documents in managing inventory:

A. Perpetual Inventory Record Card

B. Periodic Inventory Check List

C. Inventory Tags

4.32 Define "economic ordering quantity".

4.4 Personnel Records

4.41 Describe the contents of the following personnel records:

A. General Files

B. Personal Files

C. Employment Record Card

D. Payroll Records

5. MARKETING

5.1 What is Marketing?

5.11 Describe the two parts of a marketing strategy:

A. Target Markets

B. Marketing Mix

5.2 The Elements of the Marketing System

5.21 Describe the four "p's" of marketing

A. Product

B. Price

C. Place/Distribution

D. Promotion

5.3 The Marketing Plan

5.31 Identify the ten key questions to ask in developing a marketing plan.

5.32 Develop a marketing plan for your business.

5.4 Feedback and Evaluation

5.41 Explain the purpose of the following instruments in evaluating marketing strategy:

A. Supply/Demand Curve

B. Break-Even Analysis

C. Market Survey

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